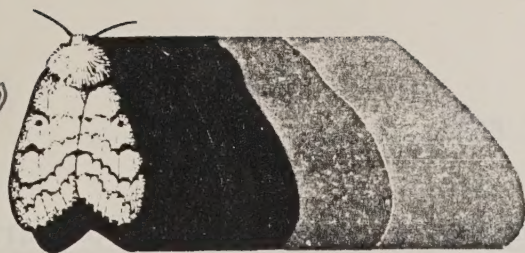


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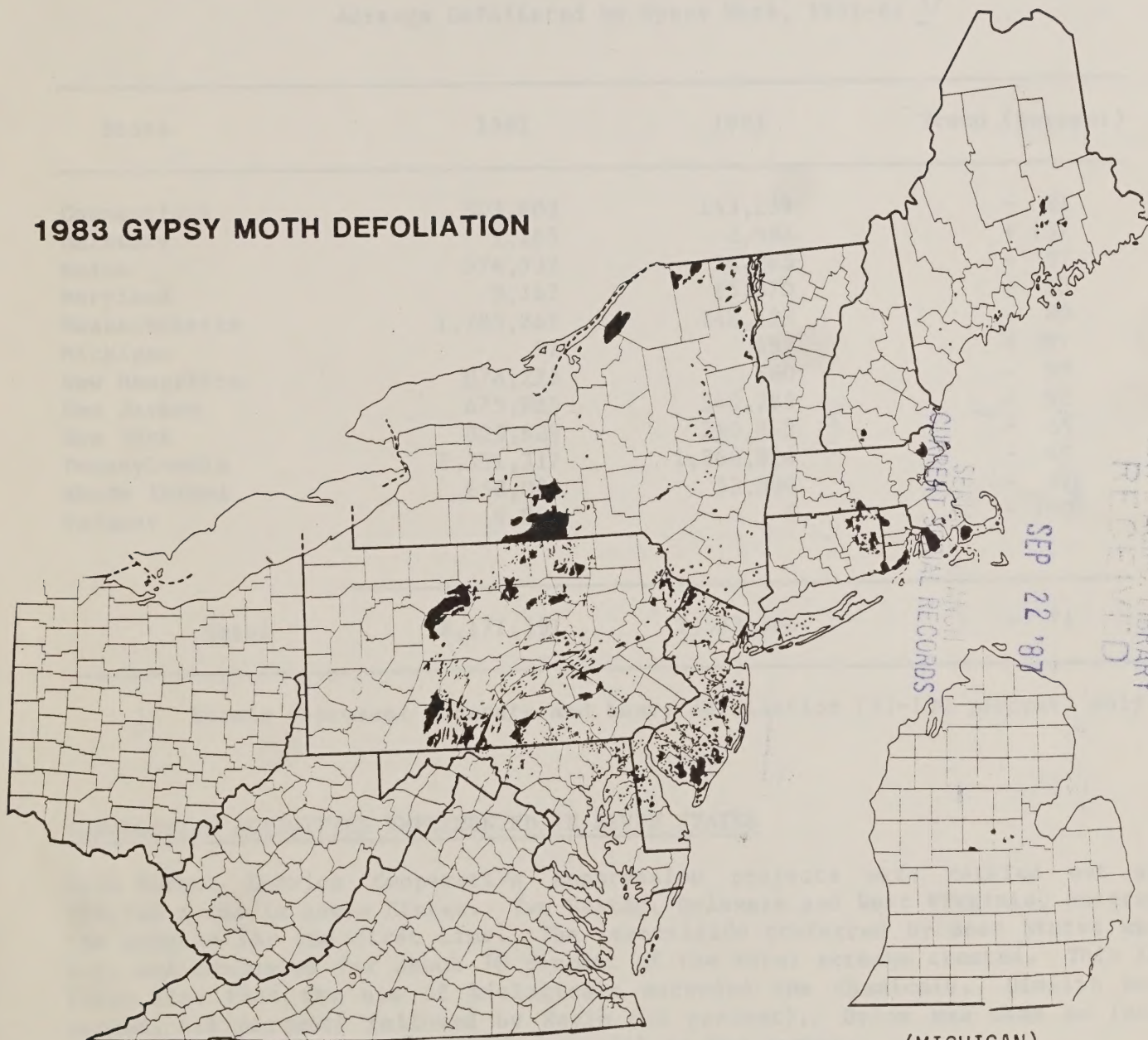


GYPSY MOTH NEWS

370 REED ROAD, BROOMALL, PA 19008
U.S.D.A., FOREST SERVICE

MARCH, 1984
Number Seven

1983 GYPSY MOTH DEFOLIATION



(MICHIGAN)

Compiled by Forest Pest Management Staff, Morgantown, West Virginia

1983 IN REVIEW

CONTINUING DOWNWARD TREND IN DEFOLIATION

Since 1982 a 71 percent total decrease in defoliated acreage occurred. The only recorded increases occurred in Delaware, Maryland, and Michigan. The 1983 figures in the table represent only moderate and heavy defoliation (31-60 percent).

Acreage Defoliated by Gypsy Moth, 1982-83 1/

State	1982	1983	Trend (percent)
Connecticut	803,802	153,239	- 81
Delaware	1,265	2,992	+ 137
Maine	574,537	16,285	- 97
Maryland	9,162	15,870	+ 73
Massachusetts	1,383,265	148,133	- 89
Michigan	92	457	+ 397
New Hampshire	878,273	560	- 99
New Jersey	675,985	340,285	- 50
New York	825,629	290,843	- 65
Pennsylvania	2,351,317	1,360,824	- 42
Rhode Island	658,000	53,880	- 92
Vermont	9,864	0	- 100
Total	8,171,191	2,383,368	- 71

1/ Totals represent moderate and heavy defoliation (31-100 percent) only.

SUPPRESSION ACTIVITIES IMPLEMENTED IN SEVEN STATES

USDA Forest Service Cooperative Suppression projects were carried out on 598,760 acres in seven States. Two States, Delaware and West Virginia, entered the program for the first time. The insecticide preferred by most States was B.t. and accounted for about 70 percent of the total acreage treated. This is first time that the use of biologicals exceeded the chemicals. Dimilin was second, (18 percent) followed by Sevin (12 percent). Dylox was used on less than 1 percent of the treated acreage, all in New Jersey.

1983 Federal/State Cooperative Gypsy Moth Suppression Projects

State	Acres Treated/Insecticide	Total Acres
Delaware	1,100 - Dimilin	1,100
Maryland	57,464 - Dimilin 50,214 - <u>B.t.</u> 12,404 - <u>Sevin</u>	120,082
Massachusetts	1,598 - <u>B.t.</u>	1,598
New Jersey	59,164 - <u>Sevin</u> 17,087 - <u>B.t.</u> 4,794 - <u>Dylox</u>	81,045
Pennsylvania	326,323 - <u>B.t.</u> 45,400 - Dimilin	371,723
Rhode Island	6,477 - <u>B.t.</u>	6,477
West Virginia	16,735 - <u>B.t.</u>	16,735
Total		598,760

OUTLYING INFESTATIONS PURSUED

USDA Animal and Plant Health Inspection Service (APHIS) in cooperation with State regulatory agencies conducted eradication treatments in 12 States last season. Here is a summary:

<u>State</u>	<u>Counties</u>	<u>Treatment</u>
California	Alameda, Contra Costa, Los Angeles, Marin, San Mateo, Santa Clara	Carbaryl
Illinois	DuPage, Kane	<u>B.t.</u> ; <u>B.t.</u> and mass trapping
Indiana	Elkhart	Carbaryl
Michigan	Kalamazoo, Muskegen, Van Buren	Carbaryl
Minnesota	Ramsey, Washington	Carbaryl

<u>State</u>	<u>Counties</u>	<u>Treatment</u>
North Carolina	Carteret	Disparlure
Ohio	Franklin, Hamilton, Knox, Lucas	Carbaryl
Oregon	Marion	Carbaryl
South Carolina	Beaufort, Horry	Carbaryl
Virginia	Floyd	Disparlure
Washington	Clark, King, Pierce	<u>B.t.</u> ; <u>B.t.</u> and mass trapping
Wisconsin	Waukesha	Mass trapping; <u>B.t.</u> and mass trapping

APHIS and cooperating State agencies continued their trapping program. Although catches were generally down in the southeast moth activity accelerated in other areas. Wisconsin reported that multiple moth catches were obtained for the first time in Sheboygan, Columbia, Washington, Sauk, and Portage Counties, and for the second time in Dane and Waukesha Counties. Minnesota reported that no male moths were caught in the Woodbury area (Washington County) which was treated with carbaryl last summer. Alabama reported 4 positive male moth catches in Winston, Montgomery, and Calhoun Counties. Trap deployment and maintenance in 1983 was quite a cooperative effort involving the Alabama Department of Agriculture and Industries, Alabama Forestry Commission, USDA Forest Service and APHIS, and National Campers and Hikers of America.

IOWA BEGINS GEARING UP FOR THE GYPSY MOTH

Federal and State personnel installed about 1,400 traps in 1983, while 300 more were issued to members of the National Campers and Hikers Association for their use. Two captures occurred very near a 1982 catch site, while 9 catches were made in a single trap on the edge of the city of Mount Pleasant. Both of these catches point to definite infestations. A Steering Committee in Iowa is setting procedures for operations in preparation for any forthcoming infestation.

VIRGINIA UPDATE

The Department of Agriculture and Consumer Services reported general infestation of the northern one-tenth of the State, which is currently regulated under Virginia and Federal Gypsy Moth Quarantines. Though no significant defoliation was observed, increased larval sightings, male moth catches, and egg mass

counts show a population increase in this area. Preliminary egg mass surveys along the Appalachian Trail on the Loudon County border with West Virginia promise defoliating populations for the first time in 1984. Larval surveys elsewhere revealed first-time activity at several sites around the Richmond metropolitan area, and at 2 locations in the Tidewater area (one of which was linked to infested Christmas trees found in a sales lot in December 1982). Reduced male moth trappings are probably a reflection of the shift in trapping away from the generally infested area (where it is less productive as a detection tool anyway) into the southwestern counties where the pest is not known to occur.

In 1983, suppression projects were conducted in the northern counties through a State/local cost-share program providing funding and technical assistance to local governments. Eighteen treatment projects covering 4,125.5 acres were conducted with pesticide and mechanical methods during May and June 1983. Pesticide treatments included the use of Dimilin, Thuricide, and Sevin.

The largest project in 1983 in terms of acreage was the treatment of 4,001 acres in Floyd and Patrick Counties with a mating disruptant, Disrupt II, in a cooperative effort with USDA/APHIS-PPQ to eliminate a very low-level isolated infestation. The pheromone, carried on white plastic confetti, was applied aerially at a rate of 130 grams (20 grams active pheromone) per acre with fixed-wing aircraft fitted with special dispensing units. An adhesive added to the confetti like material improved foliage retention. Despite some operating problems, the project was finished in 5 days. Monitoring of the area with Delta traps on a 250 m grid showed no moth catches for the first time in 4 years. This mating disruption procedure was a departure from traditional materials in Virginia. It is aimed at broadening the control options available to the State's Department of Agriculture and Consumer Services.

PENNSYLVANIA NEWS

Research Programs

Gypsy Moth Barrier Products.--The field evaluation of gypsy moth caterpillar barrier devices in both forest and shade tree situations indicates that most barriers, if properly installed and properly maintained, provide significant and practical foliage protection, even in dense infestations.

Gypsy Moth Adult Traps.--Field tests of gypsy moth pheromone traps showed their practical value as male moth-nuisance abatement devices. Substantially fewer adult males bothered homeowners when 3 traps were evenly spaced 100 to 200 feet away from family activity areas.

Reduced Application Volumes of B.t.--Test treatments with the following products were made on 3,714 acres of State forest and game lands in Fulton County:

- Dipel 4L, 12 BIU, 48oz/acre, undiluted
- Dipel 6L, 12 BIU, 32 oz/acre, undiluted
- Dipel 6L, 12 BIU, 64 oz/acre, 1:1

Dipel 8L, 12 BIU, 24 oz/acre, undiluted
Dipel 8L, 12 BIU, 48 oz/acre, 1:1
Bactospeine 35AS, 12 BIU, 96 oz/acre, 1:1
Bactospeine 72 AS, 12 BIU, 64 oz/acre, 1:1
Thuricide 32 LV, 12 BIU, 48 oz/acre, undiluted
Thuricide 48 LV, 12 BIU, 32 oz/acre, undiluted
Thuricide 48 LV, 12 BIU, 64 oz/acre, 1:1
Thuricide 64 LV, 12 BIU, 24 oz/acre, undiluted

In general, the 32 and 40 oz/acre volumes gave very poor results; the 64 oz/acre volumes were marginally effective, and the 96 oz/acre volume gave reasonably acceptable performance.

Biological Control Activities

Parasite Characterization Grant.--The U.S. Department of the Interior gave the PA Division of Forest Pest Management a grant to characterize and study the natural enemy complex of the gypsy moth at Catoclin Mountain, Gettysburg, and Delaware Water Gap National Parks.

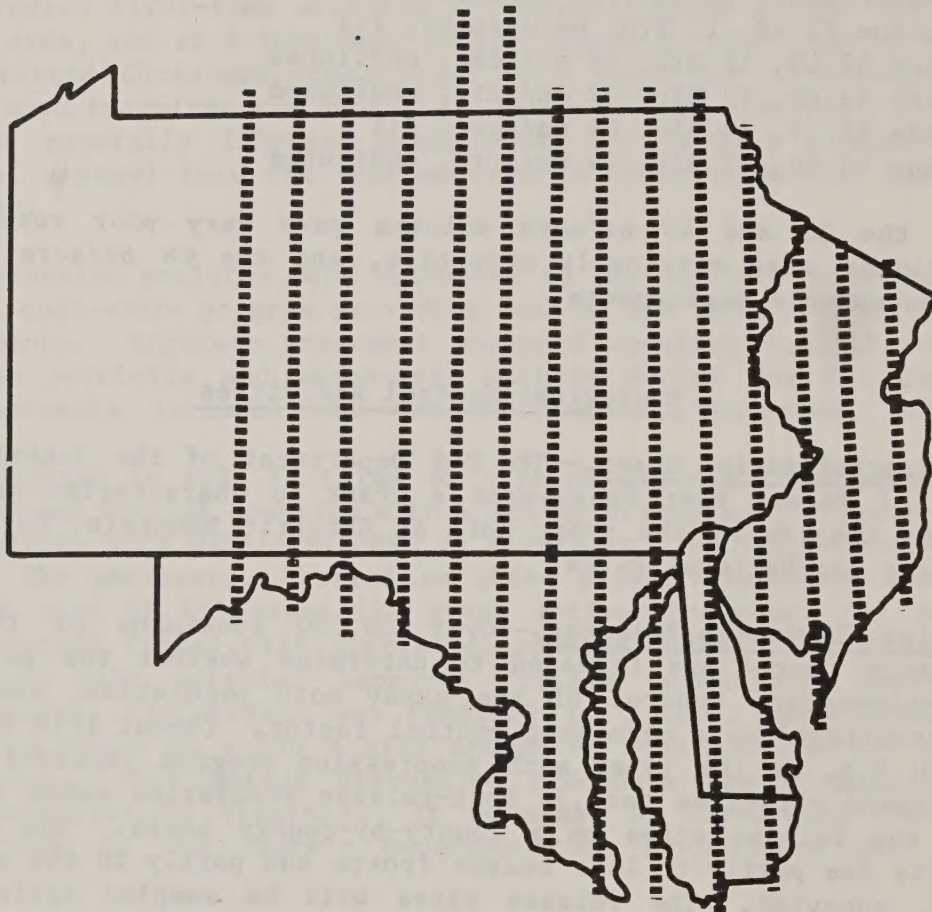
Glyptapanteles flavicoxis Releases.--Over 600,000 specimens of this parasite were laboratory reared and released to determine whether the parasite could prove a supplementary control of the gypsy moth population, and whether it could be established as a permanent control factor. (About 1/10 of the blocks sprayed with B.t. in the gypsy moth suppression program received releases of several thousand parasites each.) Post-release recoveries range from 7 to 40 percent of the release sites on a county-by-county basis. The low level of recoveries is due partly to late season frosts and partly to the effectiveness of the B.t. spraying. The release sites will be sampled again in 1984 to evaluate parasite establishment.

A PUBLIC EDUCATION ACHIEVEMENT: A GYPSY MOTH DISPLAY

The village of Barrington Hills, Illinois, in conjunction with adjoining communities, has been using a display case to familiarize area residents with the life cycle of the gypsy moth. The glass framed case holds mounted male and female adult moths as well as pupae, larvae, and egg masses. Prepared by the Illinois Department of Energy and Natural Resources, the exhibit is portable enough to be used by villages throughout this 90-square mile area of northeastern Illinois.

GYPSY MOTH AERIAL PHOTO MISSION

A Federal demonstration of the use of high altitude panoramic aerial photography for mapping hardwood defoliation by gypsy moth was conducted in cooperation with the States of Delaware, Maryland, New Jersey, and Pennsylvania (see illustration). This demonstration was based on the successful use of panoramic aerial photography for mapping defoliation in a small test site in central Pennsylvania in 1981.



Area covered by high altitude panoramic aerial photography in 1983. Dashed lines represent flight lines.

This pioneering effort was coordinated under the leadership of the Forest Service's Forest Pest Management Methods Application Group in Fort Collins, Colorado. Aerial photography was taken on June 21 and 22, 1983, using a NASA ER-2 Aircraft, an advanced version of the U-2, based at the NASA Ames Research Center, Moffett Field, California. Approximately 12,000 feet of color-IR aerial film was exposed. Film was processed and duplicated by the EPA Environmental Photographic Interpretation Center in Warrenton, Virginia. Film was annotated and separated for each State using a team of Forest Service personnel from the Methods Application Group, Northeastern Area, and the Southern Region, and delivered to State agencies responsible for mapping gypsy moth defoliation, within 10 days after the photo mission was flown.

Interpretation of the panoramic aerial photographs was done by personnel of the Delaware, Maryland, and New Jersey Departments of Agriculture and the Pennsylvania Bureau of Forestry. This was done instead of the aerial

sketchmap surveys normally flown to map widespread forest pest damage. Photo interpreters were trained by Forest Service entomologists from Doraville, Georgia, and Morgantown, West Virginia.

Photo mission timing was optimum to capture peak defoliation in Delaware, Maryland, New Jersey, and southern Pennsylvania where most of the infestations occurred in 1983. In the mountainous areas of central and western Pennsylvania, the flight was about 7-10 days too early.

Panoramic aerial photos provide for more accurate mapping of defoliation than can be done from conventional aerial sketchmapping. In addition, photos provide a permanent record of damage for detailed study when needed. Foliage protection achieved by application of aerial sprays can be assessed, and oak mortality in areas previously infested by gypsy moth can be mapped accurately.

GEOGRAPHIC INFORMATION SYSTEM FOR GYPSY MOTH

A geographic data base, designed to store, retrieve, analyze and display spatial data of gypsy moth infestations has been developed. The data base was developed for Mifflin County, Pennsylvania, as part of a 1981 evaluation of high altitude panoramic photography for mapping defoliation by the Forest Service, Forest Pest Management Methods Application Group in Fort Collins, Colorado.

Nine separate resource data themes were digitized for entry into the Geographic Information System known as MOSS--Map Overlay Statistical System. MOSS is a user friendly system developed by the USDI Fish and Wildlife Service's Western Energy and Land Use Team in Fort Collins, Colorado. This system is in the public domain and presently resides on a Data General minicomputer.

Resource data themes can be overlaid in the computer to provide both statistical and map data on location of infested areas relative to landownership for status reporting. Areas of cumulative defoliation can be obtained to aid in locating areas where tree mortality might be expected to occur. The system can also be used to measure net area of spray blocks, establish buffer zones along sensitive streams in spray blocks, and evaluate foliage protection following treatment.

Data entry, analysis and map production functions using MOSS were performed at a cost of approximately six cents per acre. The system is a dynamic one and can accept additional data themes for further analysis. Figures 1 and 2 illustrate MOSS computer-generated maps showing location of gypsy moth defoliation in Mifflin County, Pennsylvania, in 1981 and 1982, respectively. Table 3 shows a MOSS-generated statistical summary of this defoliation. A special report by the Methods Application Group on this work is in press.

FIGURE 1

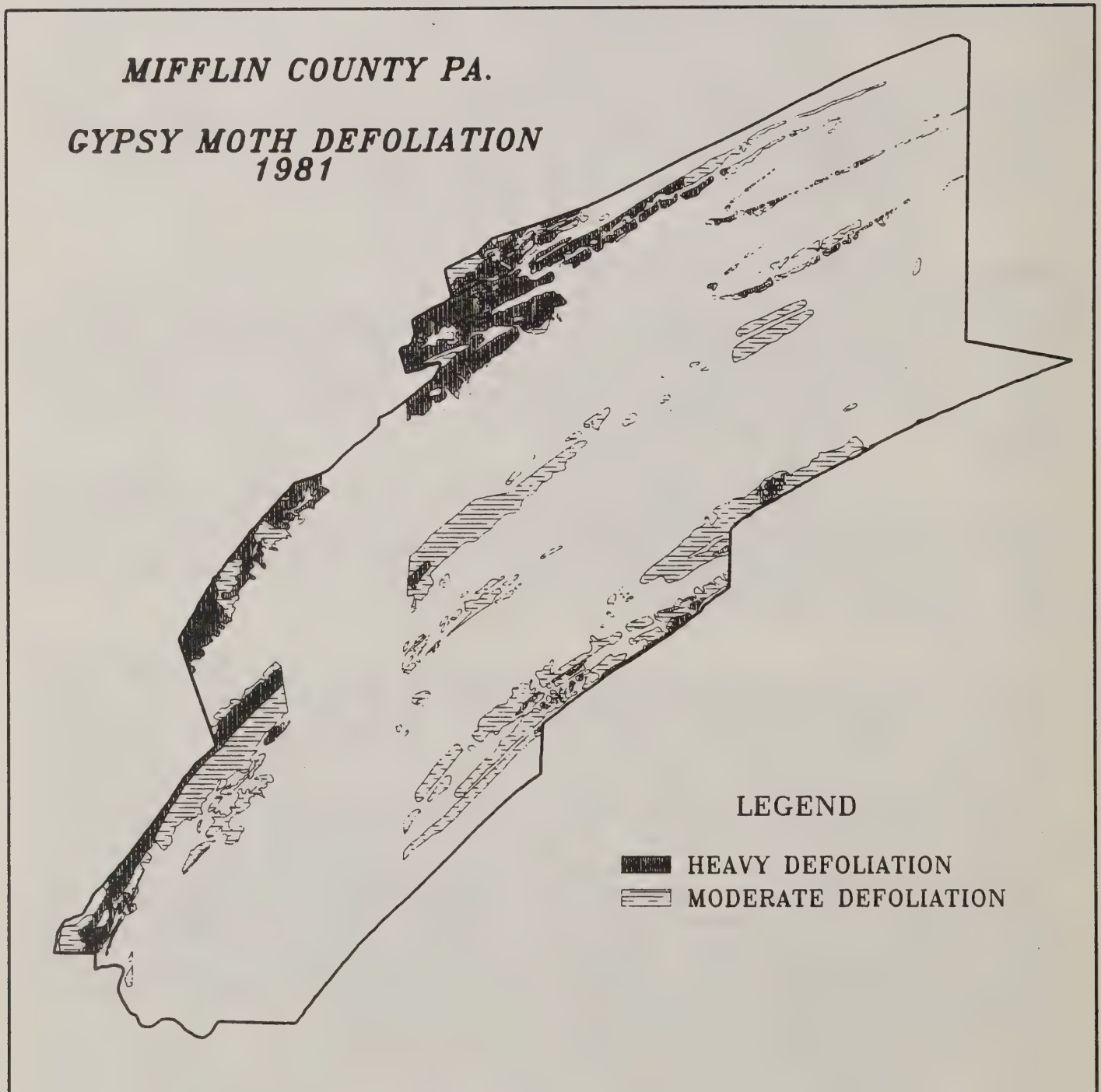


FIGURE 2

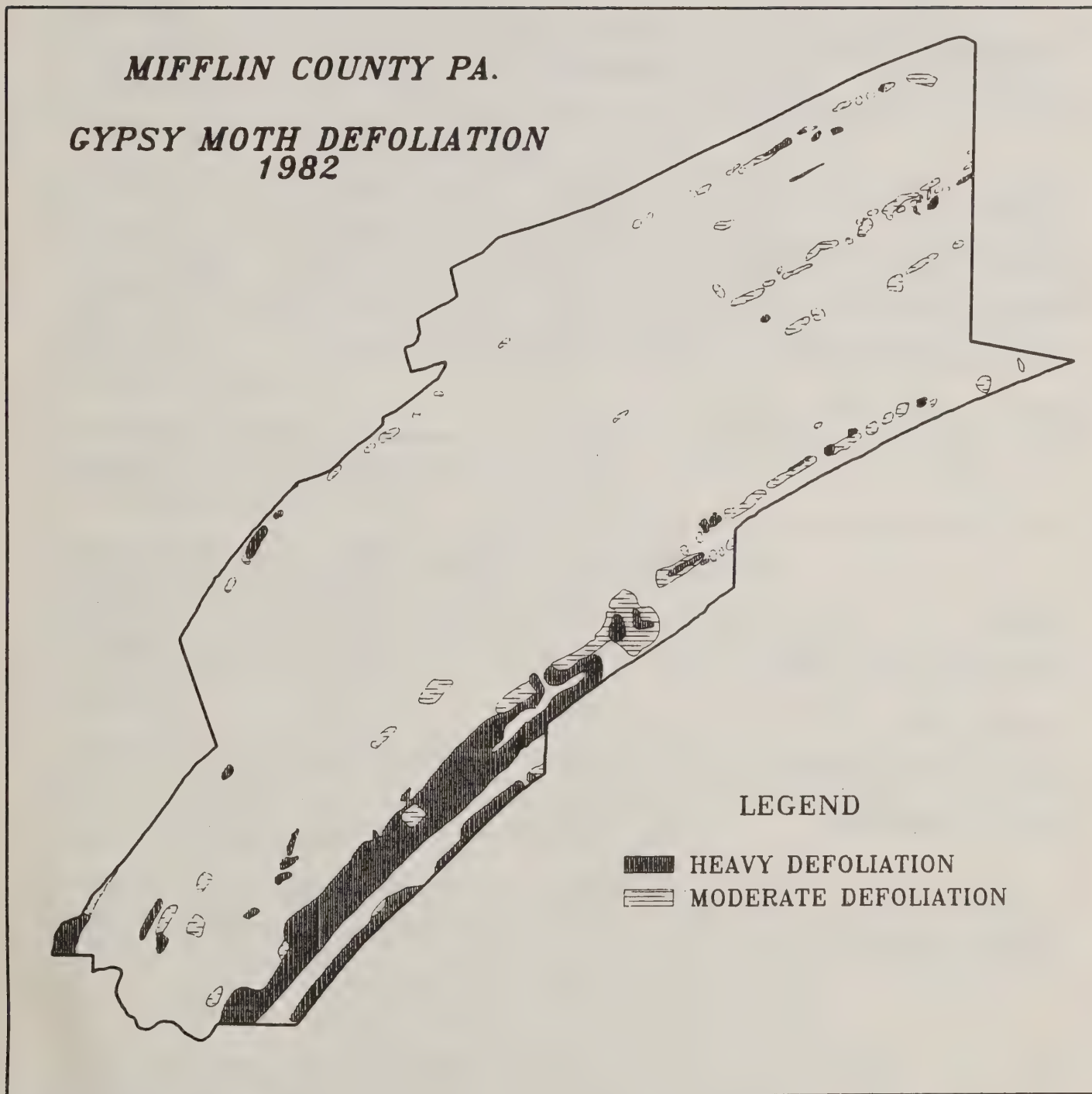


Table 3.--Area summary of 1981 and 1982 hardwood defoliation by
landownership class, Mifflin County, Pennsylvania

Landownership Class	Defoliation Class		
	Moderate	Heavy	Total
-----1981-----			
Private	18,474	8,327	26,801
Bald Eagle State Forest	2,549	1,569	4,118
Rothrock State Forest	699	6,162	6,861
Tuscarora State Forest	4,329	1,086	5,415
Reeds Gap State Park	1	0	1
Total	26,052	17,144	43,196
-----1982-----			
Private	8,359.7	7,995.5	16,355.2
Bald Eagle State Forest	1,512.8	280.0	1,792.8
Rothrock State Forest	98.0	5.6	103.6
Tuscarora State Forest	676.9	9,751.9	10,428.8
Reeds Gap State Park	0	0	0
Total	10,647.4	18,033.0	28,680.4

ASSESSING EFFECTIVENESS OF AERIAL SPRAYS FROM HIGH ALTITUDE PANORAMIC AERIAL PHOTOS

One of the most complex tasks in forest pest management is the evaluation of treatment effects. When a pest management tactic, such as an aerial application of a pesticide is undertaken, just how much loss to the resource is prevented?

In the case of gypsy moth, one of the objectives of aerial spraying is to protect trees from unsightly defoliation. Therefore, treated areas should appear green and relatively free of defoliation, whereas, surrounding untreated areas should have varying degrees of damage. This phenomenon can be seen and assessed on high altitude panoramic color-IR aerial photographs.

In a special evaluation conducted by the Forest Pest Management Methods Application Group in Fort Collins, Colorado, areas treated in 1981 in Mifflin County, Pennsylvania, were located on color-IR panoramic aerial photos taken that same year. Detailed interpretation of these photos showed apparent treatment differences in treated vs. surrounding untreated stands in two-thirds of the spray blocks examined. This approach can be used in situations where areas of similar forest cover type exist adjacent to spray blocks and where prespray insect populations are sufficiently high to cause visible defoliation detectable from the air.

Use of high altitude panoramic aerial photos for assessing effectiveness of treatments in addition to general defoliation mapping surveys increases the cost effectiveness of this photo product.

STERILE MALE MOTHS AND THE PROSPECTS FOR PEST MANAGEMENT

The Otis Methods Development Center (OMDC) in Massachusetts has been pursuing experiments in various locations on controlling low-level gypsy moth populations through release of sterile male moths for disrupting normal mating processes.

1. Benton Harbor, Michigan.--Sterile male moths were released here in 1981-82. Surveys in 1983 indicate successful elimination of this infestation. This is the first field demonstration of gypsy moth population control by releasing sterile male moths. (See GMN 1982 p. 6.)

2. South Carolina.--In 1982 an isolated infestation was treated with partially sterile males. (When partially sterile males mate with native females, all resulting progeny are sterile. These sterile offspring further mate with fertile insects). Males present in this area were trapped in 1983 and 5 of these have been mated with females in the laboratory to see if they are sterile or not. These results will be forthcoming shortly.

3. Maryland.--A cooperative test with the State Department of Agriculture, the ARS and the Forest Service was undertaken during the flight season this year, with 10,000 partially sterilized males released each day of the season in isolated woodlots. Overflooding ratios have been achieved such that the yield of sterile F₁ offspring next year should be easy to determine.

4. Wisconsin and North Carolina.--Demonstration projects continue for evaluating the mass trapping and mating disruption techniques for elimination of isolated infestations. Results are inconclusive, but encouraging.

5. Laboratory Production of Eggs.--Otis Methods Development Center (OMDC) is investigating the feasibility of producing sterile gypsy moth eggs in the laboratory for eventual release in the field where they might hatch into fully sterile adults. Up to 1 million eggs per day appears possible with present rearing facilities. Otis visualizes this kind of genetic control as helpful in managing low-level populations.

OMDC FINDS CLUE FOR FEEDING BEHAVIOR OF LARVAE IN HIGH DENSITY POPULATIONS

Why do late instar larvae in high-density populations spend the entire day feeding intermittently, while larvae in low-density populations feed almost exclusively at night when under adverse conditions in the laboratory? Experimental results suggest that defoliation-induced changes in leaf chemistry may be largely responsible for behavioral as well as developmental differences among larvae from populations of different densities.

MASSACHUSETTS HAPPENINGS

Research

Two lines of research are being pursued:

1. Long-term monitoring of gypsy moth populations is being conducted by the Entomology Department of the University of Massachusetts. Pheromone traps are being placed throughout the State in areas of previous outbreaks, especially those areas with a long history of gypsy moth problems.

2. At the University of Massachusetts, tests are under way to evaluate the effect of B.t. spraying on the subsequent occurrence of NPV epizootics. Early indications are that virus levels definitely seem suppressed in the B.t. plots compared with the control plots.

Special Projects and Demonstrations

1. The Provincetown-Truro area on Cape Cod, is choosing to take advantage of the close proximity of gypsy moth populations with one of the few remaining browntail moth populations. An attempt is underway to establish the parasite Rogas lymantria hoping that the Rogas will utilize the browntail moth as an overwintering host.

2. Using available defoliation records, an attempt is being made to determine the percentage of tree mortality directly attributable to the gypsy moth. One hundred twelve 1/10-acre plots established across the State with trees more than 3 inches at dbh classified as dominant, subdominant or suppressed. Mortality following 1 year of defoliation was found to be 2.3 percent; following 2 years, 10.5 percent; following 3 years, 12.2 percent; following 4 years, 17.9 percent; and following 5 years 20.2 percent.

Effects of Wilt Disease

After a large male moth flight was found in many heavily defoliated areas, subsequent examination showed very few females and few egg masses. Wilt disease was widespread all over the State. Speculation is that since female larvae have at least one more instar than males before pupation, they are exposed to the disease that much longer and get to the point where most of the females die.

MICROBIAL RESEARCH AT HAMDEN, CONNECTICUT

1. Seventy-five pounds of GYPCHEK have been processed and the material is stored at Ansonia. In the Spring of 1984, an additional 70 to 80 more pounds will be processed for subsequent use.

2. GYPCHEK formulation research at Otis Methods Development Center and at Hamden has progressed to the point where field evaluation of candidate formulation-adjuvant systems is being planned for 1984.

3. Addition of a sunlight simulator and a computerized droplet counter to the Hamden Center's formulation-application facility at Ansonia will allow more successful spray simulation and field evaluations of GYPCHEK and B.t. formulations.

4. In September 1983, a cooperative test was conducted to determine optimization of B.t. deposit, stickers, nozzle types, and aircraft. The participants in this study were Penn State University, APHIS, and the Hamden Center for Biological Control. Out of this test should come some protocols for B.t. applications in 1984 by APHIS and the USDA Forest Service and their cooperators. Further evaluations are scheduled for 1984.

5. Treating woodlots with GYPCHEK before larval hatch to limit gypsy moth populations to innocuous levels and keep them there-- was the subject of a cooperative study between the West Virginia Department of Agriculture, State and Private Forestry based in Morgantown, West Virginia, and the Insect Pathology and Microbial Control Work Unit from Hamden, Connecticut. The study was initiated in Jefferson and Berkeley Counties, West Virginia, in April 1983 on six woodlots, infested with 8 to 280 egg masses per acre. These were treated with a molasses-based formulation of GYPCHEK using backpack mistblowers. Egg masses which were collected soon after spraying and hatched in the laboratory showed significant virus mortality. Late instar larvae under burlap bands also showed virus, suggesting successful introduction of the agent into these populations. Evaluations of the study will continue into 1984.

U.S.-CHINA FORESTRY SCIENTIFIC AND TECHNICAL EXCHANGE

1. Under the 1983 Exchange Program in Science and Technology between the USA and the People's Republic of China, two USDA scientists (Thomas M. O'Dell of the Hamden Center and Paul W. Schaefer of the Newark (Delaware) Laboratory) spent time in oak and larch forests at the Meng Jiagang Forest

Farm, Huanan County, Heilong-Jiang Province. They conducted an intensive assessment of naturally occurring mortality factors in field populations of *Lymantria dispar*. Helped by two Chinese scientists and an interpreter, they undertook field collection and laboratory rearing of various life stages of the gypsy moth seeking potentially beneficial organisms that could be exported to the USA for culture and study in quarantine facilities. They succeeded in exporting three species of parasites which are now under study in the ARS Quarantine Facility in Newark, Delaware. Studies were also begun on the feeding behavior of parasitized and unparasitized larvae from oak and larch forests, with pheromone trap arrays installed to estimate population trends. The U.S. scientists, in turn, gave lectures to Chinese personnel on rearing gypsy moths and several of its natural enemies.

2. Four scientists from the People's Republic of China visited the Hamden laboratory in August 1983 under arrangements made by the USDA Office of International Cooperation and Development. This was the first Chinese forest entomology team to visit the United States. The team, consisting of a team leader, an entomologist, the forest pest administrator for all of China, and a provincial forest protection official, was interested in forest pest management and in forecasting outbreaks of insect pests. A 2-day stay at the Hamden laboratory and visits to the Connecticut Agricultural Experiment Station, Yale University, the APHIS laboratory on Cape Cod, the University of Maine, the Forest Service laboratory at Orono, the ARS Beneficial Insect Research Laboratory at Newark, Delaware, and the New Jersey Department of Agriculture parasite rearing facility in Trenton, New Jersey, made up the team's itinerary.

A NEW RESEARCH UNIT - SILVICULTURAL CONTROL OF THE GYPSY MOTH

A new research unit, established by the Northeastern Forest Experiment Station at Morgantown, West Virginia, has been given the task of finding the answer to one question: can silvicultural management of commercial hardwood forests produce a control for the gypsy moth?

The traditional goal of a gypsy moth control program has been to kill the pest and prevent defoliation. The research goals of the new research unit will be focused on reducing the economic impact of the gypsy moth. The 3-member team consisting of an entomologist, a silviculturist, and a system modeler, will evaluate the effects of silvicultural practices that may maximize quantitative economic gains by tailoring stand conditions--stand age, stand composition, site index, and density--to the gypsy moth and its diseases and its natural enemies such as parasites and predators. This Research Unit might confirm what has been suspected since the 1900's; namely, that stand composition (ratio of preferred to nonpreferred foods) could affect the susceptibility of the stand to gypsy moth attack and that low infestation probability through ideal stand composition could reduce defoliation and increase economic value of the stand.

The Unit plans to call on forest managers in Federal, State, and several private organizations for cooperation in the research into resource loss in a variety of stand conditions and the corresponding forest management practices. A key objective of research will be to determine the gypsy moth population

density that causes economic loss under given stand conditions. Practical field experience will be fed into the existing gypsy moth life system model to generate a forest management model that forest hardwood managers will find helpful in economic terms.

NEW FOR 1984

A NEW ENVIRONMENTAL IMPACT STATEMENT

The 1981 Programmatic Gypsy Moth EIS is being rewritten. A Draft EIS has been published with a review period that ends on February 25, 1984. The new EIS will again be a combined APHIS/Forest Service document covering Federal gypsy moth suppression and eradication projects. Publication of the Final EIS should occur by mid-March. As with the 1981 Document, State and other agencies proposing the use of Federal funds in their projects will be required to develop site-specific assessments tiered to the EIS itself.

PROPOSED 1984 STATE/FEDERAL COOPERATIVE PROJECTS

<u>State</u>	<u>1984 Suppression (Acres)</u>
DE	16,500
MD	120,000
MI AGR	2,180
NJ AGR	80,000
NJ FOR	15,000
PA	285,000
RI	5,000
WV	50,000
Total	573,680

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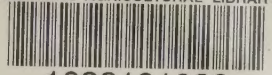
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